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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,326	12/15/2004	Takaya Sato	040-113	6733

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EXAMINER	
DIAO, M BAYE	
ART UNIT	**PAPER NUMBER**
2809	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/518,326	SATO ET AL.	
	Examiner	Art Unit	
	M'baye Diao	2809	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The disclosure is objected to because of the following informalities:

3. The word " lower that " should read -- lower than -- ([0040], line 3).

4. The word "1 direct current " should read -- the direct current -- ([0067], line 4).

Appropriate correction is required.

Claim Objections

Claims 10 & 11 are objected because of the following informalities:

In claim 10, the word " claim4" should read --claim 4 -- and in claim 11, the word " claim5" should read --claim 5 --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 10 & 11 are rejected under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as his invention.

Claims 10 & 11 recite the limitation of, "the predetermined P". There is insufficient antecedent basis for this limitation in both claims 4 & 5.

For examination purpose "the predetermined P" would read " a predetermined P".

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 & 4, 2 & 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Uchida et al., (Uchida) US PAT 5,694,019.

5. As per claim 1, Uchida discloses (col. 3, lines 29+;col. 4, lines 18+;col. 5, lines 18+) and shows in Figs. 1 -14 a battery charging apparatus(1) connected to a network management apparatus (2) (applicant's charging system for a rapid charge battery) which includes:

a battery charging unit (31) (applicant's charging equipment for said rapid charge battery);

a battery information reading unit (28), a display unit (16), and an output battery information reading unit (34), (all of which (28,16,34), interpreted as applicant's measurement display unit which measures deterioration and charging level of said rapid charge battery); and

a controller (20) (applicant's fee collection device) for calculating an appropriate payment fee (col. 5, lines 41-46).

Accordingly, claim 1 is anticipated.

6. As per claim 2, Uchida discloses (col. 3, lines 29+;col. 4, lines 18+;col. 5, lines 18+) and shows in Figs. 1 -14 a battery charging apparatus(1) connected to a network

management apparatus (2) (applicant's charging system for a rapid charge battery) which includes:

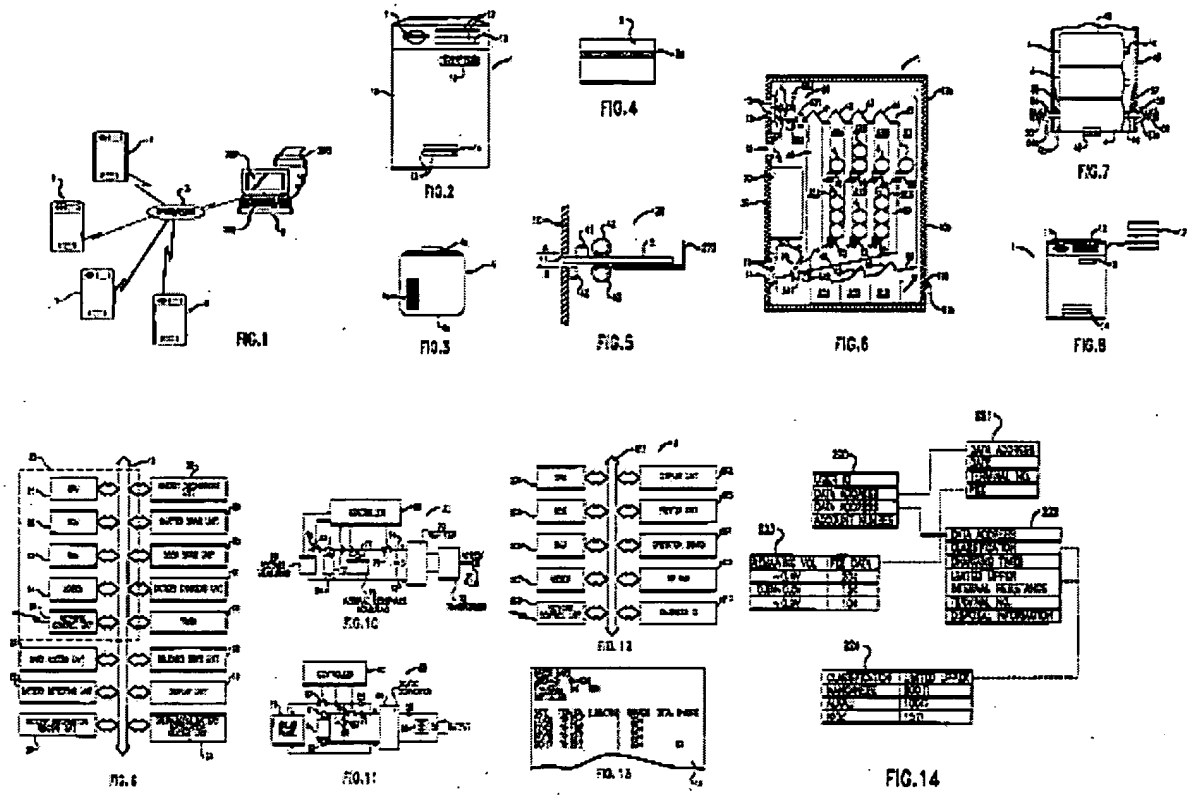
a central processing unit (CPU) (21) (applicant's charging processor), which is a part of the electric unit (70) (applicant's charging equipment for said rapid charge battery) as shown in Fig. 6, and;

a battery information reading unit (28), a display unit (16), and an output battery information reading unit (34), (all of which (28,16,34), interpreted as applicant's measurement display unit which measures deterioration and charging level of said rapid charge battery); and

a network management apparatus (2) or host computer system and controller (applicant's charging information center) which has data base to store user information thru the provision of a card (5) in the card unit access (26) to be input to the card entrance (11) as referred in Fig. 4 (col. 3, lines 58-67) and a battery charging unit (31) (applicant's charging unit). Uchida also discloses (col. 3, lines 32-43) that the network management apparatus (2), or host computer system and controller, includes an operation board (201) and a printer unit (203), and is connected to the battery charging apparatus (1) by a communication network line (3)(applicant's communication network), , for example, a PSTN (Public Switched Telephone Network), an ISDN (Integrated Service Digital Network), a wireless telephone network, thus meeting the limitation of," a charging information center which has a data base to store user information therein and a charging unit, wherein when the user utilizes said charging processor, said charging

processor and said information center communicate with each other via a communication network ".

Accordingly, claim 2 is anticipated.



As per claim 3, Uchida discloses (col. 5, lines 1-16) and shows in Figs. 1 & 6-9, the battery charging apparatus (1) (applicant's charging system for the rapid charge) that the electric device (70) (applicant's charging equipment) including the CPU (21), ROM (read only memory) (22), a RAM (random access memory) (23), a MODEM (24), a network control unit (25), a card access unit (26), a battery detecting unit (27), a battery information reading unit (28), an energy discharging unit (35), a shutter drive unit (29), a door drive unit (30), a battery charging unit (31), a timer (32) for counting a clock, a solenoid drive unit (33) for driving the stoppers (49), and (52), a display unit (16), and

an output battery information reading unit (34), all of which are coupled to each other by system bus (19). The CPU (21), the ROM (22), the RAM (23), the MODEM (24), and the network communication unit (25) form a controller (20). He further discloses that the shutter drive unit (29) drives the shutters (13) and (15) by a solenoid (not shown) based on an indication of the CPU (21).Similarly the door drive unit (30) also drives the doors (41)-((44), (62), and (63) by a solenoid (not shown) based on an indication of the CPU (21). Referring to Fig. 10, the battery charging unit (31) receives an input, as an example, an AC 100V by a plug (71) and changes the AC 100V by a to a predetermined direct current voltage by transformer (72) and then, the battery charging unit (31) outputs a predetermined direct current voltage to a pair of electrode pins (53), (54). Switch devices (76),(77), and (79) are included and are controlled by the controller (20).The controller (20) by turning on and off the switch device (76) and (79) enable the voltage measuring circuit (80) to output the measured voltage to the controller (20) at a predetermined time (col. 5, lines 48-65), thus meeting the limitation of " said charging information center has a control unit monitoring and controlling the deterioration of the rapid charge battery; and said control unit notifies the user via said charging processor when the deterioration of the rapid charge battery goes below a predetermined level."

Accordingly, claim 3 is anticipated.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 4-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida et al., in view of Kaminaka et al., (Kaminaka) US PAT 6,835,496.

10. As per claims 4-5, Uchida discloses (col. 3, line 55) and shows ion Fig. 3, a battery (4) for use in the battery charging apparatus (1) (applicant's charging system for the rapid charge battery) including a pair of terminals (4a), (4b) (applicant's positive and negative electrodes, respectively) and having a bar code (4c) in which, battery classification, such as the type of battery (e.g. manganese battery, alkali battery, lithium battery, Ni-Cd battery, etc) a battery charging time etc., may be recorded.

Uchida differs from the claimed invention because he does not specifically disclose that the battery charging apparatus is a non aqueous electrolyte secondary battery which comprises positive and negative electrodes having materials that occlude and release a lithium ion and containing non aqueous electrolyte having lithium salt and organic solvent.

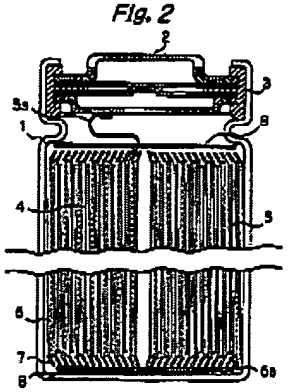
Kaminaka discloses (col.4, lines 1-18; col. 30, lines 37-67) and shows in Fig. 2 a non-aqueous electrolyte secondary battery equipped with a non-aqueous electrolyte and positive (5) and negative (6)electrodes which can reversibly occlude and release lithium. The positive electrode preferably comprises a lithium-containing transition metal compound as an active material, and the non-aqueous electrolyte is preferably a solution of a lithium salt dissolved in an organic solvent containing a carbonate ester. He further discloses (col. 4, lines 47-54) that the Si phase grains forming the core are an active substance for a negative electrode. By forming an intermetallic compound with Li (such as $Li_{22}\ Si_5$), they can reversibly combine with and dissociate from lithium. Namely, at the time of charging, they combine with Li to occlude Li, and at the time of discharging, they disassociate from Li to release Li.

Kaminaka is evidence that ordinary workers in the art would find a reason, suggestion or motivation to use a non-aqueous electrolyte secondary battery which is preferably a solution of a lithium salt dissolved in an organic solvent. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the battery charging apparatus of Uchida by using a non-aqueous electrolyte secondary battery which is preferably a solution of lithium ion salt dissolved in an organic solvent for advantages such as, to provide a negative electrode material for a non-aqueous electrolyte secondary battery which can occlude and release large amounts of Li and which therefore, when used as a negative electrode material for a non-aqueous electrolyte secondary battery, provides a high charge and discharge

capacity, a small decrease in capacity during repeated charging and discharging, and an excellent cycle life (col. 3, lines 17-25).

Accordingly, claims 4-5 would have been obvious.

Fig. 2



11. As per claims 6 & 7, Uchida differs from the claimed invention because he does not disclose the battery charging apparatus(1), if a charging current flows (obviously when connected to an AC 100V by a plug (71), electrons migrate or flow from the negative electrode to the positive electrode) in the battery charging apparatus (applicant's rapid charge battery) after completing the charging reaction, the battery charging apparatus causes migration of electrons only and functions to prevent said electrode active material from transformation.

Kaminaka discloses (col. 4, lines 39-60) that the phase of an Si-containing solid solution or intermetallic compound which is the enveloping material, restrains changes in volume of the Si phase accompanying occlusion and release of Li and it suppresses cracking and powderization thereof, thereby increasing the cycle life.

Kaminaka is evidence that ordinary workers in the art would find a reason, suggestion or motivation to use a non-aqueous electrolyte secondary Lithium battery

with a solid solution or intermetallic compound which is the enveloping material whose object is to restrain volume changes of the Si phase grains which are the active material of the negative electrodes.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Uchida by using a Lithium ion battery charging system and including in it a solid solution or intermetallic compound which is the enveloping material whose object is to restrain volume changes battery charging apparatus in such way that, if a charging current flows in the battery charging apparatus (applicant's rapid charge battery) after completing the charging reaction, the battery charging apparatus causes migration of electrons only and functions to prevent said electrode active material from transformation, for advantages such as restraining changes in volume of the Si phase accompanying occlusion and release of Li and suppressing cracking and powderization thereof, thereby increasing the cycle life, as per the teachings of Kaminaka.

Accordingly, claims 6 & 7 would have been obvious.

12. As per claims 8 & 9, Uchida differs from the claimed invention because he does not specifically discloses the battery charging apparatus being a non aqueous electrolyte secondary battery which involves the electrolyte with a material subject to oxidation at the positive electrode and causes an oxidation reaction different from the lithium release reaction at the positive electrode while causing a reduction reaction different from said lithium occlusion reaction at the negative electrode.

Kaminaka discloses (col.4, lines 1-18; col. 30, lines 37-67) and shows in Fig. 2 a non-aqueous electrolyte secondary battery equipped with a non-aqueous electrolyte and positive (5) and negative (6) electrodes, which can reversibly occlude and release lithium. The positive electrode preferably comprises a lithium-containing transition metal compound as an active material, and the non-aqueous electrolyte is preferably a solution of a lithium salt dissolved in an organic solvent containing a carbonate ester. He further discloses (col. 4, lines 47-54) that the Si phase grains forming the core are an active substance for a negative electrode. By forming an intermetallic compound with Li (such as $Li_{22}\ Si_5$), they can reversibly combine with and dissociate from lithium. Namely, at the time of charging, they combine with Li to occlude Li, and at the time of discharging, they disassociate from Li to release Li. He further discloses (col. 3, lines 55-65; col. 4, lines 12-16) that the negative electrode is made of a powder of metallic Si or of an alloy containing an Si phase that is adhered atop a negative electrode substrate to form a powder layer on the substrate, thereafter a material comprising an element capable of forming a solid solution or an intermetallic compound with Si is plated on the powder layer.

Kaminaka is evidence that ordinary workers in the art would find a reason, suggestion or motivation to use a non-aqueous electrolyte secondary battery with different electrodes material, a negative electrode formed with Si phase as core and a positive electrode made of Lithium containing transitional metal.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Uchida by using a Lithium ion battery charging

system and including in it, a non-aqueous electrolyte secondary battery with two different active material at its electrodes, Si and Li, which involves the electrolyte with a material (negative electrode Si, positive electrode Li) subject to oxidation (col. 5, lines 41-53) at the positive electrode and causes an oxidation reaction different from the lithium release reaction at the positive electrode while causing a reduction reaction different from said lithium occlusion reaction at the negative electrode by assuring that the average diameter of the Si phase grains falls between 1μm and 35μm, for advantages such as preventing oxidation and making the restraining envelope to work effectively (col. 5, lines 66-67; col. 6, lines 1-3), as per the teachings of Kaminaka.

Accordingly, claims 8 & 9 would have been obvious.

13. **Claims 10 & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida in view of Kaminaka and further in view of Minamiura et al., (Minamiura) US PAT 6,459,238.**

As per claims 10 & 11, Uchida discloses (col. 4, lines 61-67; col. 5 lines 1-30) and shows in Figs. 6-7 & 9, the battery charging apparatus (applicant's battery charging system) comprising an electric device unit (70) (applicant's charging equipment of the rapid charge battery) which includes the CPU (21), ROM (read only memory) (22), a RAM (random access memory) (23), a MODEM (24), a network control unit (25), a card access unit (26), a battery detecting unit (27), a battery information reading unit (28), an energy discharging unit (35), a shutter drive unit (29), a door drive unit (30), a battery charging unit (31), a timer (32) for counting a clock, a solenoid drive unit (33) for driving the stoppers (49), and (52), a display unit (16), and an output battery information

reading unit (34), all of which are coupled to each other by system bus (19). The CPU (21), the ROM (22), the RAM (23), the MODEM (24), and the network communication unit (25) form a controller (20).

Uchida when modified by Kaminaka still differs from the claimed invention because Uchida combined with Kaminaka does not disclose that the charging equipment of the rapid charge battery is designed such that when charging the electric current values (X ampere, X≥0A) and the charging time (t seconds, t≠0 second) with the predetermined P in combination with any of $P_1\ (X_1, t_1) \rightarrow\ P_2\ (X_2, t_2) \rightarrow P_3\ (X_3, t_3) \rightarrow\ \ldots\ P_n\ (X_n, t_n) \rightarrow P_{n+1}\ (X_{n+1}, t_{n+1})$(here, n=integer of 1 or more), the electric current values (X ampere) of the continuous charging pattern (P) are different from each other.

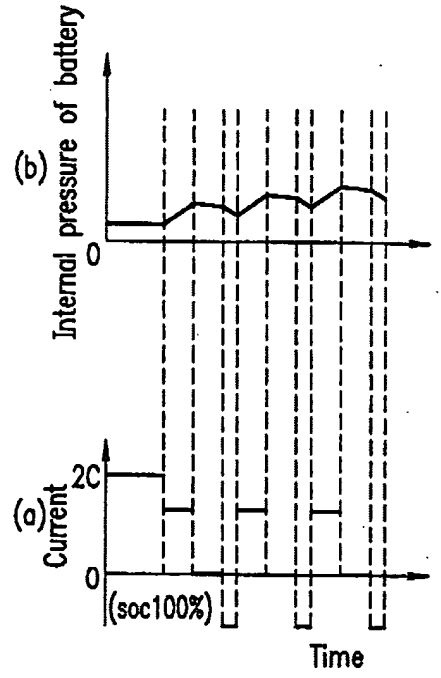
Minamiura discloses (col. 5, lines 42-51) and shows in Fig.6 that after the battery pack is charged with a constant current at a rate of 2 C until the remaining battery capacity (SOC) reaches 100%, charging at a low rate of about 0.3-1.5 C, a suspension of charging, and discharging of the battery pack may be repeated in this order as shown in part (a) of Fig. 6. The charging at a low rate, the suspension of charging, and the discharging of the battery pack are each performed for an appropriate time period of about 10 seconds to about 40 minutes (representing applicant's different time and current for each time period).

Minamiura is evidence that ordinary workers in the art would find a reason, motivation or suggestion to use an alternated way of charging, suspension of charging, discharging of the battery pack.

Therefore it would have been obvious to one of ordinary skill in the art to use the constant current charging with alternative charging and discharging pattern for the battery charging apparatus of Uchida modified by Kaminaka for advantages such as an increase in the internal pressure of each battery unit, as per the teachings of Minamiura (col. 5, lines 57-61).

Accordingly claims 10 & 11 would have been obvious.

FIG. 6



14. **Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida in view of Merritt US PAT 6,121,751.**

15. As per claims 12 & 14,and 13 & 15, Uchida differs from the claimed invention because he does not specifically discloses that the electric device unit (applicant's charging equipment) of the battery charging apparatus (1) using a combination of direct current charging and constant voltage charging.

16. Merritt discloses (col. 1, lines 35 – 67; col. 2, lines 1- 2) a battery charging apparatus and method for charging a stack of multiple lithium ion battery cells charges the stack of cells by a combination of switch capacitance cell balancing and cell voltage monitoring to provide a charge cycle that starts with a nominally constant current charging and easily shifts to constant voltage taper charging.

Merritt is evidence that ordinary workers in the art would find a reason, suggestion or motivation to combine a direct current charging and a constant voltage.

Therefore it would have been obvious to one of ordinary skill in the art to use the combination of direct current charging constant voltage charging in the battery charging apparatus of Uchida, for advantages to balance the cells and matching of the desired voltage within 1% (col. 1, lines 10 – 25), as per the teachings of Merritt.

Accordingly, claims 12-15 would have been obvious.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

18. Miller et al., (Miller) US PAT 5,363,031, discloses a fast battery charger.

19. Saar et al., (Saar) US PAT 4,388,582, discloses an apparatus and method for charging batteries.

20. Patino, US PAT 5,825,159 discloses a battery charging method for properly terminating rapid charge.

21. Lehmann et al., (Lehmann) US PAT 3,853,627, discloses lithium electric cells with novel positive active materials and non-aqueous electrolyte.

22. Matsumoto et al., (Matsumoto) US PAT 5,909,101, discloses a battery charger detecting full charge of batteries using a thermostat and thermistor in a battery pack.

23. Crews, US PAT 3,904,947, discloses a vehicle mounted battery charging system for an electric motor vehicle.

24. Mori et al., (Mori) US PAT 6,794,849, discloses a battery based power supply device and associated maintenance system.

25. Aranovich et al., (Aranovich) US PAT 6,111,389, discloses a rapid charging battery without overcharging.

26. Patino et al., (Patino) US PAT 5,241,259, discloses a method and apparatus for rapidly charging a battery at high temperature.

27. Kalogeropoulos et al., (Kalogeropoulos) US PAT 6,337,560, discloses a life cycle charging for batteries.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to M'baye Diao whose telephone number is 571-272-9748. The examiner can normally be reached on M - TH from 8:30 am to 5:00 pm. The examiner can also be reached on alternate Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur Chowdhury, can be reached on M – F from 8:00 am to 5:00 pm at (571) 272-2287. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M'baye Diao
Examiner
Art Unit 2809

M.D

THAO X. LE
PRIMARY PATENT EXAMINER